Pipestone River Provincial Park Interim Management Statement

Ontario

Ministry of Natural Resources

Hon. Vincent G. Kerrio
Minister

90-00937/

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REGIONAL DIRECTOR'S APPROVAL STATEMENT

This Interim Management Statement will provide interim direction for the management of Pipestone River Provincial Park until a comprehensive Park Management Plan is prepared.

This statement will provide the basis for the subsequent preparation of the Park Management Plan.

I am pleased to approve this Interim Management Statement for Pipestone River Provincial Park.

D. R. Johnston
Regional Director
Northwestern Region

INTRODUCTION

The purpose of this Interim Management Statement is to identify:

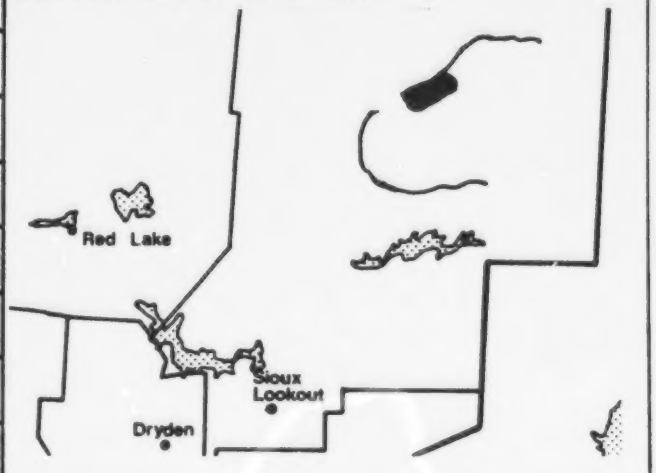
i) park values which are to be protected;

ii) resource management prescriptions necessary to protect these values; and

iii) restrictions on use of natural resources within the park.

This Interim Management Statement is not intended to replace a Park Management Plan. Rather it is intended to guide the use of natural resources and related activities within the park until such time as a Park Management Plan is prepared.

BACKGROUND INFORMATION

NAME: PIPESTONE RIVER	**REGIONAL SETTING MAP** 
PROPOSED CLASS: Waterway	
M.N.R. DISTRICT: Sioux Lookout	
M.N.R. REGION: Northwestern	
TOTAL AREA(ha): 97,375 **LAND:** **WATER:**	
SITE REGION: 3S-Lake St. Joseph 2W-Big Trout Lake	
SITE DISTRICT: 3S-1, 2W-3	
DATE In REGULATION: 1989.05.27	

TARGETS

1 LIFE SCIENCE REPRESENTATION

site type/landscape unit	species/communities
L.U. 12 - Big Beaverhouse Moraine L.U. 13 - Horseshoe L. Bedrock Complex L.U. 19 - Agutua Moraine - Central Portion L.U. 20 - Lac Seul Moraine - Lake St. Joseph	Central Boreal Forest and Northern Boreal Forest Regions and associated vegetation complexes

2 EARTH SCIENCE REPRESENTATION

geological theme	feature
Late Archean Tectonic	Uchi and Sachigo subprovinces - instrusive plutonic rocks.
Timiskaming Interstadial	Big Beaverhouse and Agutua Moraines - lacustrine silts, inland dunes, eskers.

3 CULTURAL RESOURCE REPRESENTATION

theme	theme segment
Unknown	Unknown

4 RECREATION OPPORTUNITIES

day use	car camping	wilderness/back country
N/A	N/A	47,000

INVENTORIES

level \ type	earth science	life science	cultural	recreational	other
reconnaissance completion date	Nov. 1979 Feb. 1980				
detailed completion date					
required?	yes	yes	yes	yes	(Fisheries) yes

DATE 1989.06.01

MANAGEMENT GUIDELINES

I. Land Tenure

There are presently eight Land Use Permits for outpost camps located within the park area. These include:

Tourist Operator	Lake
Patricia Fly-In Camps	Williams Lake
Albany River Outfitters	Otoskwin Lake
	Bow Lake
Central Patricia Outfitters	Assine Lake
	Wastayanipi Lake
	Markop Lake
	Pipestone Lake
	Kinloch Lake

In addition, one Land Use Permit for a remote cottage is located on Williams Lake within the park.

Guideline

Existing outpost camps will be permitted to continue operations within the park. No further expansion or increased land tenure will be considered pending the completion of the park management plan. Outpost camp operations may also be subject to relocation as a result of management planning.

The one existing remote cottage will be permitted to continue as a non-conforming use and will be phased-out over a 21 year period of time effective January 1, 1989. This Land Use Permit will not be reissued to a new owner and will be cancelled and the cottage removed/dismantled when no longer required.

No other forms of land tenure will be considered pending the completion of the park management plan.

II. Land Acquisition/Disposition

There is presently no patented land within the park area and no disposition will occur pending the completion of the park management plan.

III. Existing/Proposed Development

There is no existing development within the park and none will be considered pending the completion of the park management plan.

Highway 808 provides access to the park at Badesdawa and Horseshoe Lake.

IV. Recreation Activities

Existing recreational activities include sport hunting and fishing and back country camping and canoeing.

Guideline

The above recreational activities will be permitted to continue and will be further addressed during the development of the park management plan. Sport hunting will be permitted to continue on an interim basis by regulation under the Game and Fish Act, and will be further addressed during the preparation of the park management plan. The Pipestone River Provincial Park will be considered to be a non-operating park until such time as a management plan is completed for the waterway. In the interim, normal park fees will not apply. Non-residents of Canada are subject to the conditions of the Crown land camping program and the camping permit requirement.

V. Commercial Activities

Eight commercial tourism outpost camps and nine boat caches exist within the park area.

Commercial fishing for yellow pickerel, northern pike and whitefish occurs on Kinloch, Otoonabee, Obabika and Bow Lakes and for yellow pickerel only on Misamikwash Lake.

Commercial bait fishing occurs in the park south of the 11th baseline.

Portions of 17 Status Indian operated traplines and two trapline cabins are located within the park area.

The park contains several areas of high mineral potential.

A Ministry of Transportation gravel pit (#1618) is located within the park.

Guidelines

Existing tourist outpost camps and related activities (eg. boat caches, aircraft landings, motorboats) will be permitted to continue within the park and will be further addressed within the park management plan. No further tourist industry expansion will be permitted within the park at this time.

Commercial fishing, including commercial bait fishing south of the 11th baseline, will continue to be permitted in the interim until addressed in the park management plan. No new licences will be issued and where licences lapse, they will not be renewed. Commercial bait fishing and the use of live bait is not permitted north of the 11th baseline.

Commercial trapping within the park is undertaken only by Status Indian trappers. Such trapping activity will be permitted to continue. No new traplines will be permitted and the transfer of traplines must be approved by the Ministry of Natural Resources. Transfers of traplines from Status Indian people to other than Status Indian people will not be permitted. Only Status Indian trapper helpers are permitted to assist Status Indian trappers. Existing trapline cabins will be permitted to continue in their present locations. No additional cabins or the relocation of existing cabins will be considered pending the completion of the park management plan.

Work operations will continue to be permitted at the present Ministry of Transportation gravel reserve. Further aggregate extraction or expansion of the existing reserve will not be permitted. When no longer required, this gravel pit will be rehabilitated to its natural condition.

Other forms of commercial activities such as mineral exploration/extraction, hydro development and aggregate extraction will not be permitted.

VI. Native Interests

The park lies within the Treaty #9 area. It borders the Kingfisher Lake Indian Reserve and is located in close proximity to the Wunnummin Lake Indian Reserve. Status Indians enjoying treaty rights to carry on traditional natural resource harvesting activities will be permitted to carry on those activities in accordance with the terms of their treaty within the Pipestone River Waterway Park. Accordingly, such Status Indians will be permitted to carry on those activities in certain circumstances. The details of those circumstances will be the subject of further discussion and review.

VII. Natural Resources

A number of earth science values have been identified for the park as detailed in the attached check sheets. Interim management efforts will be directed towards the protection of these identified values. Natural fires will be allowed to burn undisturbed unless they threaten human life, lands outside the park, or values for which the park was established. Fires resulting from human causes will be suppressed. Fire suppression techniques used will have as minimal effect as possible on the park environment. Such means of suppression as bulldozing, and water bombing with chemical additives, will not be permitted except in critical situations.

VIII. Cultural Resources

The site of the Big Beaverhouse Hudson Bay Trading Post is located within the park. A detailed field inventory will be required to further document this cultural resource value.

IX. Client Services

Information on the Pipestone River Provincial Waterway Park is minimal at this time. It may be appropriate to produce an information brochure on the natural and cultural values within the park at some time in the future.

X. Research

More detailed earth science, life science, historical/ archaeological, recreational and fisheries inventories will be required prior to the preparation of the park management plan.

Research activities that will enhance our scientific and resource knowledge of the park will be encouraged.

XI. Marketing

A marketing strategy for this waterway class provincial park will be addressed during the preparation of the park management plan.

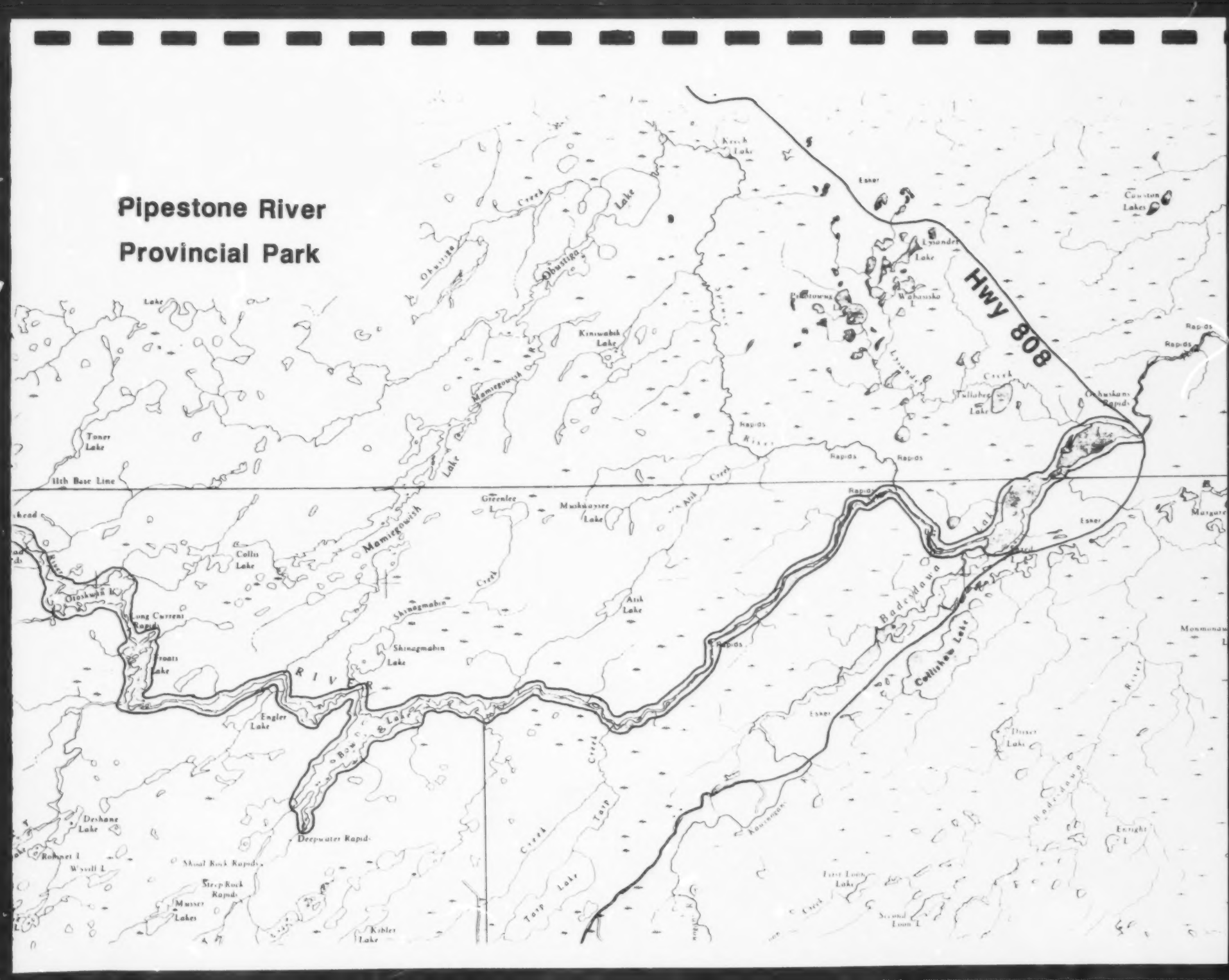
Sources/References

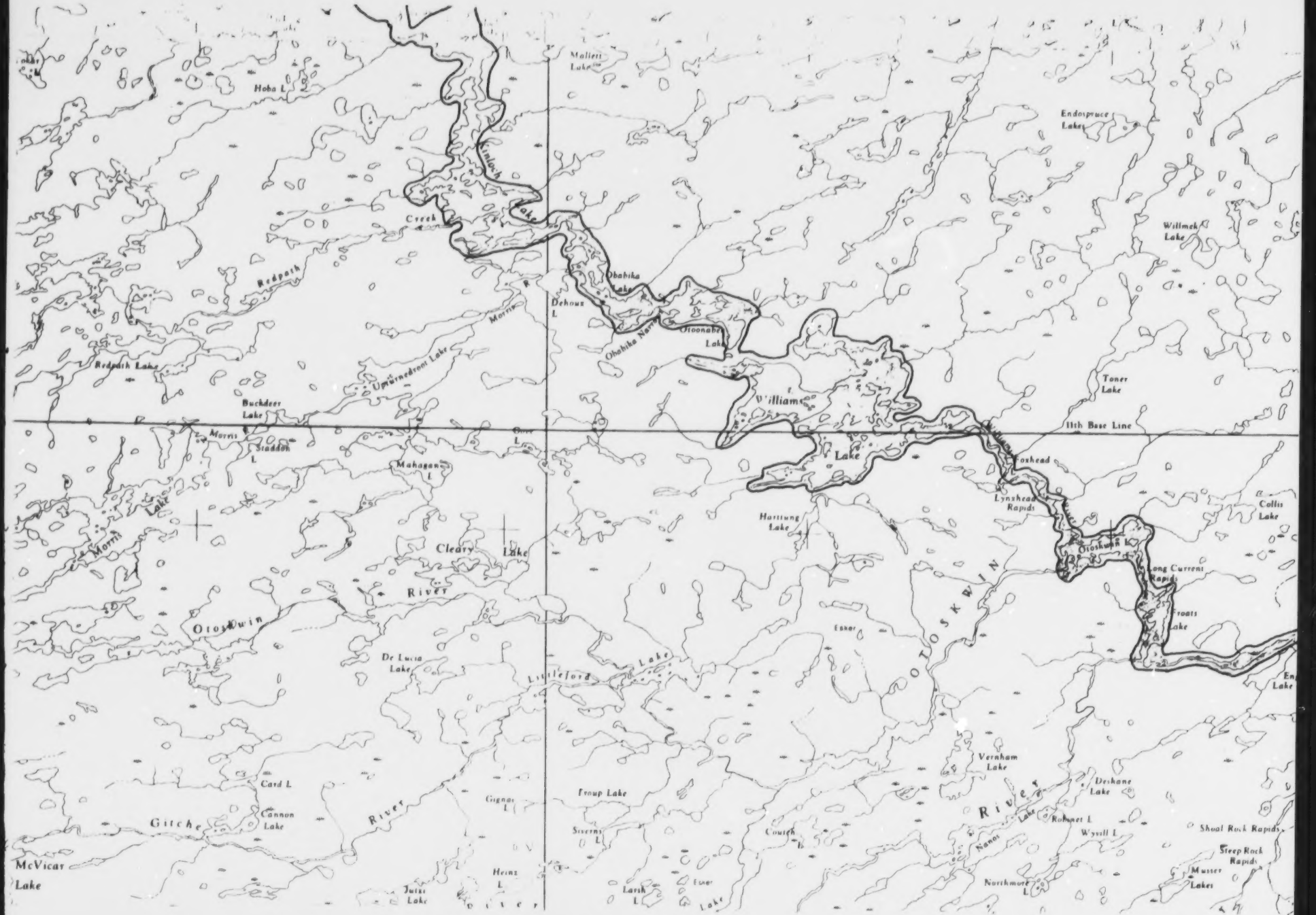
Gray, Stephen L. 1980. Life Science Systems Planning Report West Patricia Land Use Plan.

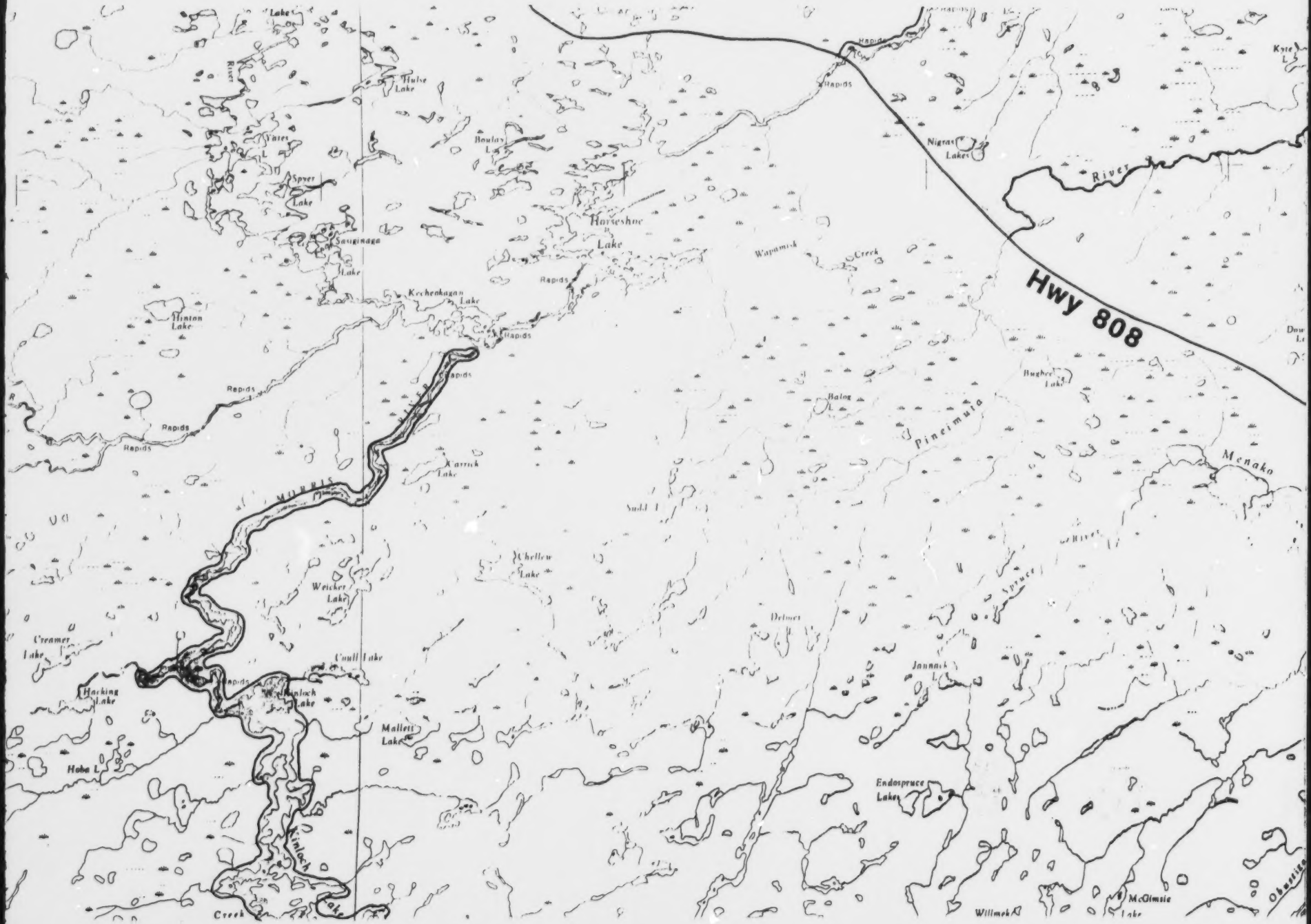
Harvey, E. T. 1980. Earth Science Systems Planning in the West Patricia Planning Area, Final Report.

Harvey, T., S. L. Gray, B. Thacker 1980. Landscape Units of the West Patricia Land Use Planning Area.

Ontario Ministry of Natural Resources, Backgrounder - District Land Use Guidelines, June 1983.


Pipestone River
Provincial Park
Hwy 808
Toner Lake
11th Base Line
Collis Lake
Mamiegowish Creek
Greenlee L.
Muskwaysee Lake
Kinwabik Lake
Obwatiga Creek
Lyxander Lake
Wabassko L.
Tallabert Lake
Rapids
Esnagi Lake
Ash Creek
Ash Lake
Shinagmabin Creek
Shinagmabin Lake
Long Current Rapids
Engler Lake
Bay
Deepwater Rapids
Shoal Rock Rapids
Steep Rock Rapids
Deshane Lake
Wassell L.
Mussett Lakes
Kobler Lake
Toop Creek
Toop Lake
Badesdawa Creek
Collishaw Lake
Kawingasa Creek
Knight L.
Second Loon L.
Dusser Lake
Monmonaw L.


Hoba L
Mallett Lake
Endospruce Lakes
Willmek Lake
Kinloch Creek
Kinloch Lake
Redpath Lake
Redpath
Morris R
Obahika Lake
Dehoux L
Obahika North
Oloonaba Lake
Upper Redpath Lake
Buckdeer Lake
Morris
Steadon L
Mahagen L
Toner Lake
11th Base Line
Williams Lake
Foxhead
Lynshead Rapids
Collis Lake
Harkung Lake
Otoskwin L
Long Current Rapids
Cleary Lake
Otoskwin River
Esker
De Lucia Lake
Littleford Lake
Troats Lake
Veraham Lake
Deshane Lake
Card L
Cannon Lake
Gitche
Gignac L
Froup Lake
Sievens L
Couch L
Nanos Lake
Rahmet L
Wyvill L
Shoal Rock Rapids
Steep Rock Rapids
McVicar Lake
Heinz L
Northmore L
Musser Lakes
Larsh L
Esker Lake


Hwy 808
Horseshoe Lake
Rapids
Nigras Lakes
River
Wapamick Creek
Kyte L.
Hulse Lake
Boulay L.
Spver Lake
Savignaga Lake
Kechenagan Lake
Hinton Lake
Rapids
Rapids
Rapids

Lafferty Lake
Schryburt Lake
Opasiminikan River
Pascalinun
Keemel Lake
Kiraff Lake
Kari Lake
Eastern
Obabigan Lake
Liberi Lake
Markop Lake
Rapids
Heaton L.
Lucas Lake
Norbury L.
PINE MUTA
Harland L.
Forester Lake
Melford Lake
Boyce Lake
Kitchenham Lake
Barrigar Lake
Chilton L.
Callinge L.
River
Rapids
Newagank Lake
Labreche Lakes
Brock Lake
PIPESTONE
Cochinet
Lemay Lake
Kawin L.
Decarie L.
Macklin Lake
Dumond
Nigras Lakes
Lecompte Lake
Wights Lake
Dillen Lake
Wapamisk Creek
Hwy 808

Lake
Big North Lake
Esker
Esker
Maria Lake
Kingfisher Lake
Chiah Lake
Lake
Corbiere L.
Downes Lake
Wachusk R.
Big Beaver House
Wunnummin Pen
Bury Island
Island
Point
River
Bianco L.
Pipestone R.
Hilliard Lake
PIPESTONE
DRIVER
Pamplin Lake
Swalm Lake
Attawapiskat Lake
Lafferty
Creek
Bate L.
Blake L.
Wallington Lake
Rapids
Reserve Ln
Wilhelm L.
Papimiskan Rapids
Rapids
Sims L.
Rapids
Cathrine Lake
Cordick Lake

EARTH SCIENCE INVENTORY CHECKLIST

NAME	MAP NAME	MAP NUMBER	UTM REFERENCE
Pipestone River		52O,52P,53B,53A	

COUNTY	LAT.	LONG.	ALT. MIN. MAX.
District of Kenora			

TOWNSHIP
Patricia Portion

LOT CONCESSION

AREA
acres ha.

OWNERSHIP
Crown

ADMINISTRATION

MNR REGION & DISTRICT	CONSERVATION AUTH.
NWR-Sioux Lookout	

AERIAL PHOTOGRAPHS — BASEMAPS

YEAR ROLL FLIGHT LINE NUMBERS

1:50,000 NTS MAP SHOWING AREA BOUNDARIES

EARTH SCIENCE FEATURES

- a wide variety of bedrock elements from Uchi, Berens and Sachigo subprovinces
- four major landscape units
- late Timiscaming Interstadial - largely associated with the depositon of the Agutua Moraine

SENSITIVITY

- largely unknown with the exception of major dune field east of Agutua Moraine

SIGNIFICANCE

-contains an outstanding cross-section of bedrock and terrain elements of the West Patricia Planning Area associated with the Agutua Moraine

MAJOR REFERENCES

DATE COMPILED	COMPILER
February, 1980	E. Harvey, Ministry of Natural Resources Box 89, Cochenour, Ontario P0V 1L0

Ontario Ministry of Natural Resources, Division of Parks, Parks Planning Branch, Queen's Park, Toronto, Ontario, M7A 1W3

Bedrock Geology:

The Pipestone River traverses several structural subprovinces of an Early Precambrian (Archean) complex of the Superior Province of the Canadian Shield. At the origin of the waterway near Pickle Lake the Kawinogans River crosses part of the Uchi Belt (comprised of east trending metasedimentary - metavolcanic greenstone belts separated by granitic stocks and botholiths). The Otaskwin-Dobie-Morris River segments traverse what is commonly thought to be part of the Berens River Plutonic Belt (composed of gneissic granodiorites and composite granitoid batholiths). The remaining northern section of the river flows through another subprovince called the Sachigo or God's Lake Belt (Riley et al., 1971). This belt is similar to the Uchi and characterized by smaller belts of supracrustal rocks (predominantly metavolcanic) oriented westerly or southeasterly, surrounded by oval-shaped batholiths.

Bedrock mapping of this area has generally concentrated upon the greenstone belts. Helicopter reconnaissance surveying has been carried out in the Pickle-Horseshoe-Forester Lakes area by Sage and Breaks (1976, Operation Pickle Lake) and to the north-east by Thurston, Sage and Siragusa (1979, Winisk Lake area). The following description summarizes information presented in the above references since time and financial constraints prevented detailed field evaluation.

The part of the Pickle Lake Belt traversed by the waterway has a very low outcrop frequency with the exception of July Falls at Hwy. 808. Here a late mafic stock of variable composition (metagabbro to metadiorite) is exposed and displays weak to moderate cataclasis.

There is virtually no outcrop in the Badesdawa Lake area owing to substantial drift cover but the segment from the Dobie River to the Kinlock Lake area has a high frequency of bedrock outcrop. The lake shapes are controlled by the bedrock fracture pattern and the complex granitic intrusions have been described as mainly massive, porphyritic to equigranular biotite quartz monzoite to granodiorite.

A minor greenstone belt of the Sachigo subprovince outcrops about Horseshoe Lake, trending in an east-west direction for about thirteen miles. Mafic to intermediate metavolcanics are intensely foliated andesite to basalt, although stretched pillows are exposed at several locations. Felsic metavolcanics are not common. Metasediemnts are best exposed on the south shore of Horseshoe Lake and the assemblage includes greywacke (in graded beds) interbedded with argillites (varve-like laminations showing a variety of sedimentary structures), arkose, quartzite and conglomerate (suggested to be local laharic breccias or slump breccias associated with volcanism). The belt has been intruded by a large mafic intrusion, metagabbroic in compostion, and is well exposed to the south and west of the lake. Subsequently the units of the belt have been folded to a near vertical postion. Miomatites, marginal to the belt are evidence of granitic intrusion and migmitization at a later time. One major fault strikes east-west forming the north contact with the granitic batholith.

Bedrock outcrop is not frequent in the vicinity of the Agutua Moraine and to the north along the River. A southern extention of the North Caribou Belt is crossed near Forester Lake and mafic to intermediate metavolcanics and metasediments are exposed at the river's edge. North of Karl Lake to Wunnummin Lake, migmatites and felsic intrusives predominate. South of the abandoned community of Big Beaver House and west of the Pipestone River lies a late Precambrian carbonite complex (called the Big Beaver House Complex). The complex is composed predominantly of carbonate with only minor amounts of associated mafics and has been date (K-Ar on biotite) at 1109 ± 61 my (Thurston et al., 1979).

Surficial Geology:

The glacial history of the deposits that the waterway traverses is dominated by a striking northwest-southeast end moraine called the Agutua Moraine. It is believed to have formed about 9,000 yrs. B.P. since a re-advance in the Miminisk area is correlated with the Nakina Moraine (Prest, 1963, 1970) which has been dated by Saarnisto (1974) at 9,000 yrs. (Timiscaming Interstadial). Prior to the formation of the moraine the Lac Seul Lobe was active to the west and deposited a grey to yellow-brown non-calcareous silty sand till. Esker systems, trending west and south-westerly are well developed in the terrain, and the surface morphology in the Pickle Lake area is strongly fluted (drumlinoids are very elongate).

Prest (1963) documented at least one re-advance of the ice to the Agutua Moraine to the north (at Windigo Lake) and to the south (in the Miminiska Lake area). This advance deposited a finer grained till (a calcareous brown sandy silt till). During retreat from the Agutua Moraine, DeGeer moraines were frequently formed, a minor halt position is indicated by a hummocky ablation moraine near Karl Lake and a major halt occurred south of Wunnummin Lake. The subdued, discontinuous deposit has been called the Big Beaver House Moraine and it is traversed by the river just north of Asinne Lake.

Glacial Lake Agassiz was always ponded against the ice front, winnowing moraine deposits and spreading fine grained deposits in lowlying areas. Lake Agassiz sought an outlet to the south along the ice front when it stood at the Agutua Moraine. An extensive area of sands and silts were deposited to the west of the moraine, while the western side of the Agutua Moraine has been bevelled and terraced by the Lake. A large delta was deposited just north of Badesdawa Lake (Prest, 1963). As the ice receeded, the lake followed the ice front into the Wunnummin Lake area and could have been connected with Lake Barlow-Ojibway to the east. Thick silts were deposited in this area as well. As uplift continued, Lake Agassiz became more confined to the Sandy Lake Basin and eventually sought outlets to the north.

Surficial mapping in the area traversed by the waterway has only been at the reconnaissance level first by Prest (1963 at a scale of 1 inch to 8 miles between 51°N and 53°N). Publication by the Ontario Centre for Remote Sensing of series of preliminary maps (1:250,000) has just presented results of helicopter supported field sampling (1977) and aerial photo analysis for the same area as well as to the north. The author has studied the Agutua Moraine on several occasions by car (along Hwy. 808). Road-cut sections and brief traverses during 1978 and 1979 permitted a better understanding of the Agutua Moraine. Logistical

problems prevented a boat survey of the Horseshoe Lake area in 1979. To summarize and simplify the complex area traversed by the River, a series of physiographic segments have been delineated. These are largely based upon a series of landscape units which have been described for the West Patricia Planning Area for Park Planning purposes (Harvey and Gray, 1979). A longitudinal profile and field notes are also attached.

Segment I Lac Seul Moraine - Lac St. Joseph Portion

The Kawinogans River traverses a drumlinized till plain which has been heavily modified by lacustrine action. Compact silt and fine sand frequently lie between the notched drumlinoids. The river crosses a large esker trunk system between July Falls and its entrance to Badesdawa Lake. In general, the river in this segment is narrow, sluggish with organic banks common.

Segment II Agutua Moraine - Central Portion

The segment containing Badesdawa Lake and the Otoskwin River as far upstream as Bow Lake is a lowlying area containing considerable depths of calcareous lacustrine silty clay grading with depth to varved clays. These deposits are usually covered with extensive wetland. Badesdawa Lake is elongate, undoubtedly affected by the large esker trunk system on its southeast side. The cuspate shorelines are occasionally sandy but frequently lowlying. The Otoskwin River in this stretch is wide and sluggish.

Segment III Lac Seul Moraine - Lac St. Joseph Portion

Between Bow Lake and Kinlock Lake, the waterway is dominated by the bedrock drift system of the landscape unit. Thin sands, wave washed ground moraine and frequent bedrock uplands attest to the strength and duration of Lake Agassiz in this area. Lakes are rectilinear to irregular in character and river distance is small compared to total water distance through this area. Shorelines are often steep, broken occasionally by south-east trending esker trunk systems that have provided material for sandy shorelines. A number of drumlinoids are found in the Bow Lake vicinity.

Segment IV Agutua Moraine - Central Portion

The waterway between Kinlock and Horseshoe Lake traverses lowlying silty lacustrine deposits, similar to the Badesdawa Lake area. The thickness of the deposits increases along the Morris River, whose course is partly deflected by a large terraced esker trunk system near Carrick Lake. Again the river is wide, sinuous with few lake stretches, contrasting markedly with Segment III.

Segment V Horseshoe Lake - Wharram Lake Bedrock Complex

The waterway between Horseshoe Lake and Forester Lake traverses various terrains. The first is a bedrock dominated landscape about Horseshoe Lake that consists of a bedrock drift complex (bare bedrock uplands with pockets of cream-buff calcareous silt till and thin fine sands and silts in lowlying areas). The lake has a typical rectilinear shape resulting from bedrock fracture patterns with bedrock frequently exposed on the shore's edge. The second terrain is the Agutua Moraine which has a typical terraced western flank composed of proglacial deltaic deposits overlying till. Dry outwash channels forming a spectacular braided pattern occur just north of the river. The eastern third is typically unmodified by Lake Agassiz composed of cream-buff sandy silt calcareous till. The

terrain is frequently kettled and hummocky with a striking east-facing ice contact slope. On the eastern side of the moraine and south of the river is the largest dune field in the West Patricia Planning Area (see separate checksheet). North of the dune field the waterway traverses more bedrock dominated terrain with sparsely covered bedrock uplands and silty to sandy lowlands. The gradient of the river is high and the sinuous channel is marked by numerous rapids.

Segment VI Agutua Moraine - Central Portion and Big Beaver House Moraine

This segment of the river as far north as Asinne Lake crosses two landscape units, but this is because the material traversed is the same (but at different proportions in the two areas). This is a lacustrine bedrock complex of wave washed ground moraine and bedrock overlain by variable thicknesses of calcareous silts and clay and usually overlain by substantial thicknesses of organics. Near Markop Lake and Kari Lake DeGeer moraines are numerous, marking a halt in the northeastward recession of the glacial front. The river is sinuous and becomes more sluggish with only a few rapids, in contrast to the previous segment. Organic, lowlying shorelines are numerous.

Segment VII Big Beaver House Moraine

From where the river traverses the Big Beaver House Moraine to Wunnummin Lake, lake travel predominates. The Big Beaver House Moraine is a subdued, wave washed feature composed of ice contact stratified material and end moraine (brown sandy silt till). North of the moraine the ground moraine surface is weakly fluted and less modified by wave action. Thin silts may be found along the shorelines of the waterway although bedrock shorelines may also be encountered.

Significance:

This waterway has tremendous potential to provided representation of earth science elements of the West Patricia Planning Area because of the variety of terrains through which it passes. It can present a good cross-section of the geology and geomorphology of the area through which it passes without restricting potential use. Nodes, carefully placed to broaden representation of earth science elements are also presented. In more detail the following points present the waterway's potential to represent earth science elements.

1) Representation not sufficient alone to adequately represent the Berens River subprovince but contains a moderate variety of granitic textures and compositions.

2) Representation not sufficient alone to adequately represent the Sachigo subprovince. Shoreline outcrops of the Horseshoe Lake Belt and the Forester Lake Belt could provide interesting and representative examples of some mafic metavolcanics and particularly sedimentary structures in metasediments.

3) Representation not sufficient alone to represent the late Timiscaming Interstadial but important and significant contributions are made - namely Lake Agassiz wave-washed terrain; calcareous silts and clay flanking the Agutua Moraine; the Agutua Moraine and its characteristic form (assuming node is included); Big Beaver House Moraine and several other minor moraines; DeGeer moraines. As a

further analysis of representation, the following Landscape Units are well represented (assuming the inclusion of recommended nodes):

Landscape Unit	Components	Representation
1. Lac Seul Moraine- Lac St. Joseph Portion	-ice contact stratified drift	moderate
	-drumlinized till plain	poor
	-bedrock drift complex	over-represented
2. Agutua Moraine- Central Portion	-morainic upland	good
	-esker trunk systems	good
	-lacustrine silts	good
3. Horseshoe Lake- Wharram Lake Bedrock Complex	-bedrock drift complex	good
	-ground moraine	moderate-poor
4. Big Beaver House Moraine	-ice contact stratified drift	poor
	-ground moraine	good
	-lacustrine bedrock complex	excellent

4) Significant contribution to the glacial process/landform theme and the lacustrine process/landform theme with interesting examples of the Agutua Moraine, outwash systems, esker-kame systems. A moderate variety of ground moraine terrains, largely modified by Lake Agassiz. DeGeer moraines near Karl Lake are the best in the West Patricia Planning Area.

5) Although poorly documented, the Pipestone River and other parts of the waterway contain a variety of fluvial landforms but no aspects of the fluvial process/landform theme stand out.

6) On the east side of the Agutua Moraine, representation of the aeolian processes/landform theme can be accomplished (see additional check-sheet on dunes).

Recommendations:

1) That the Pipestone River be considered as a Waterway Class Provincial Park because of the variety of terrains that can be represented. Even though the Severn River is a far superior candidate, the Pipestone River waterway would still be a suitable candidate. The following nodes or expanded areas are recommended in order to represent more completely the terrain through which the river traverses:

   a) an expansion northwest of Badesdawa Lake to create a more cohesive unit and to represent lowland wetlands and lacustrine depositis. A partial link with the proposed candidate to the east (Crown Reserve) could serve the same purpose.

   b) expansion north of Bow Lake to provide more representative elements of the Lac Seul Lobe - Lac St. Joseph Portion.

   c) selected shoreline outcrops in the Horseshoe Lake area to represent greenstone belt.

d) expansion north and south of the Pipestone River to capture the typical aspects of the Agutua Moraine - both modified and unmodified portions.

e) expansion to the east of the Agutua Moraine to provide representation of an excellent dune field (see separate checkshee).

f) small expansion near Markop Lake to represent excellent DeGeer moraines.

2) The dune elements and the DeGeer Moraines near Markop Lake warrant representation in the Parks system if the Pipestone waterway is not chosen as a Park candidate.

Dune field along the Pipestone River.

EARTH SCIENCE INVENTORY CHECKLIST

NAME	MAP NAME	MAP NUMBER	UTM REFERENCE
Inland Dunes			

COUNTY	LAT.	LONG.	ALT. MIN. MAX.
West Patricia Planning Area			

TOWNSHIP

LOT CONCESSION

AREA
acres ha.

OWNERSHIP
mostly Crown

ADMINISTRATION

MNR REGION & DISTRICT	CONSERVATION AUTH.
Red Lake Sioux Lookout and	Geraldton

AERIAL PHOTOGRAPHS – BASEMAPS

YEAR ROLL FLIGHT LINE NUMBERS

1:50,000 NTS MAP SHOWING AREA BOUNDARIES

see attached

EARTH SCIENCE FEATURES

small inland dune fields associated with Agutua Moraine and several esker trunk systems
- parabolic and poor transverse types present
- very few are in active state

SENSITIVITY

very sensitive to disturbance

SIGNIFICANCE

Aeolian Landforms Theme
Pipestone River dunes recommended as Nature Reserve
Pembina and Achapi sites of potential as well

MAJOR REFERENCES

Prest, 1963; David, 1979- see attached

DATE COMPILED	COMPILER
Nov. 1979	T. Harvey, MNR, Box 89, Cochenour, Ontario

Ontario Ministry of Natural Resources, Division of Parks, Parks Planning Branch, Queen's Park, Toronto, Ontario, M7A 1W3

Earth Science Features:

Inland dunes are an unusual and interesting aspect of the surficial materials in Northern Ontario. Because of their sensitivity to human activity and their unusual character, special attention has been given to locating and studying inland dunes in the West Patricia Planning Area.

The location of dunes is dependent upon the availability of material of a suitable grain size which has not been anchored or protected by vegetation some time in the past. Most of the dunes are associated with moraines. They are most frequently found on the flanks where glaciofluvial or glaciolacustrine fine sediments were exposed as ice receeded from its morainic position. In the West Patricia Planning Area dunes are closely associated with several moraines- the Lac Seul Moraine and more commonly the Agutua Moraine. Two other sites are associated with large trunk esker systems (Achapi and Pembina) while several others lie in the silty Lake Agassiz lowlands which has been called the Agutua Moraine Central Portion Landscape Unit by the author (Harvey and Gray, 1979). The accompanying map shows the known locations. It is interesting to note that no dunes have been recorded along the Opasquia Moraine and only one has been recorded on the Sachigo Interlobate Moraine. This is unusual because the character of the Moraines is very similar to the Agutua. The Big Beaverhouse Moraine is discontinuous and partially buried, and conditions during deposition were likely not conducive to dune formation.

Dune formation is to a large degree dependent upon the presence of moisture (David, 1979). In Canada, sand available for dune formation is usually wet or moist. This usually leads to the development of parabolic shapes (a frontal baseline which is convex down wind and a baseline at the back which is also convex). Initial transportation of sandy materials leads to accumulation in the form of small sporadic mounds or as transverse dunes (set across, or at right angles, to the prevailing wind direction). These shapes are common (Nos. 1, 3, 4, 5, 7, 12) and likely reflects wind action that was both weak and of short duration which caused sand to drift but not to be carried very far. If vegetation cover becomes disturbed the wind can deflate the sand from the exposed deposit and accumulate it along the edge of the break on the vegetation cover. The resulting shape is necessarily parabolic. This is the most common form of dune in the Planning area and likely stable forms during their formation. There is some suggestion by some authors that parabolic dunes could breakdown under continued deflation into longitudinal dunes. However any pseudo-longitudinal dunes observed (No. 11 and 12) are most likely extensions and modifications of existing structures (eskers, De Geer moraines). This phenomenon has also been observed in Scandinavia on materials of glaciofluvial origin (Seppala, 1972). Many of the dune fields have swales or deflation basins filled with water or are flanked by extensive patterned fens and associated palsas.

Probably the most striking and well developed dune field in the Planning area is found on the eastern flank of the Agutua Moraine south of the Pipestone River. Nearly all are parabolic in shape, oriented by a west wind, possibly funnelled through the channel in the Agutua Moraine cut by the Pipestone River and its precurors. Many of the parabolic dunes are interconnected to resemble a series of longitudinal and transverse dunes; they

are largly inactive and vegetated rising up to 15 metres in height; are located on thin glaciofluvial and glaciolacustrine silts in a lowlying area with numerous patterned fens throughout (see attached air photo). Water fills some of the deflation basins. One long longitudinal dune at 53B/7 680 965 could have been a minor moraine but appears to have been subsequently modified by the wind. It is suggested by Prest, 1979, that dunes must have developed just after deglaciation (about 9000 yrs. B.P.) and their orientation may in part be determined by the wind regime along the edge of the glacial front.

The dunes developed south of Echoing Lake on the Sachigo Interlobate moraine lie in a shallow glaciofluvial basin (from OCRS preliminary mapping). While poorly developed one long arcuately shaped transverse ridge may originally been a morainic ridge. It became vegetated before further deflation created a series of parabolic dunes.

The dunes along the Pembina River north of Lake St. Joseph are associated with wave washed flanks of esker-trunk systems. Single parabolic or low transverse dunes rise above patterned fens, providing an interesting contrast to the larger dune fields associated with the Agutua Moraine.

SIGNIFICANCE AND RECOMMENDATIONS:

Dunes are an unusual, sensitive feature and representation of the aeolian landform theme in Ontario can be achieved by incorporating examples of these features in the Park System. Stringent management is required for these features because they are so susceptible to human activity. When vegetation cover is disrupted, blow-outs occur and the feature is usually destroyed in a short space of time.

The Pipestone River Dunes is the best example of dunes in the Planning area and ranks as an important site in the Province as well. Protection as a Nature Reserve is therefore recommended either as a separate entity or as a zone in the proposed Pipestone Waterway. This site would provide representation of fine dune morphology, its common association with morainic flanks and record events during the late Timiscaming Interstadial. Exact boundaries are not presented because of the cursory study afforded the site. Longistical problems prevented a visit in the field during 1979.

The Pembina River and Achapi Lake locations are of interest because the dune morphology and site location is a little different, due to their association with esker systems. While it does not appear necessary to establish a Nature Reserve for these sites, future park proposals in the area might consider their incorporation. Achapi Lake could be included as part of the proposed Albany Waterway.

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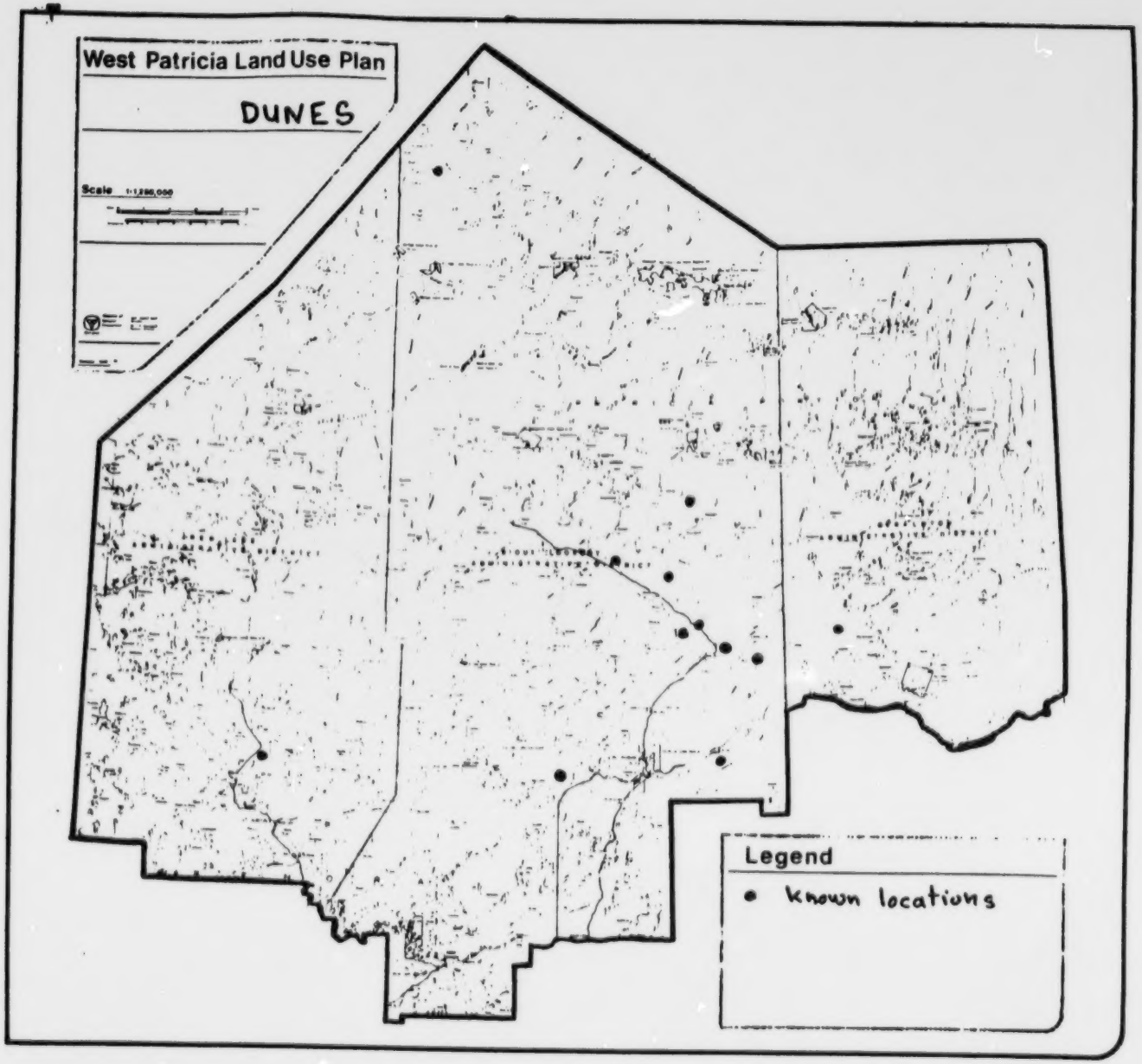
SEPPALA, Matti, 1972. "Location, Morphology and Orientation of Inland Dunes in Northern Sweden" Geog. Ann., 54 (2), Ser. A. 85-104.

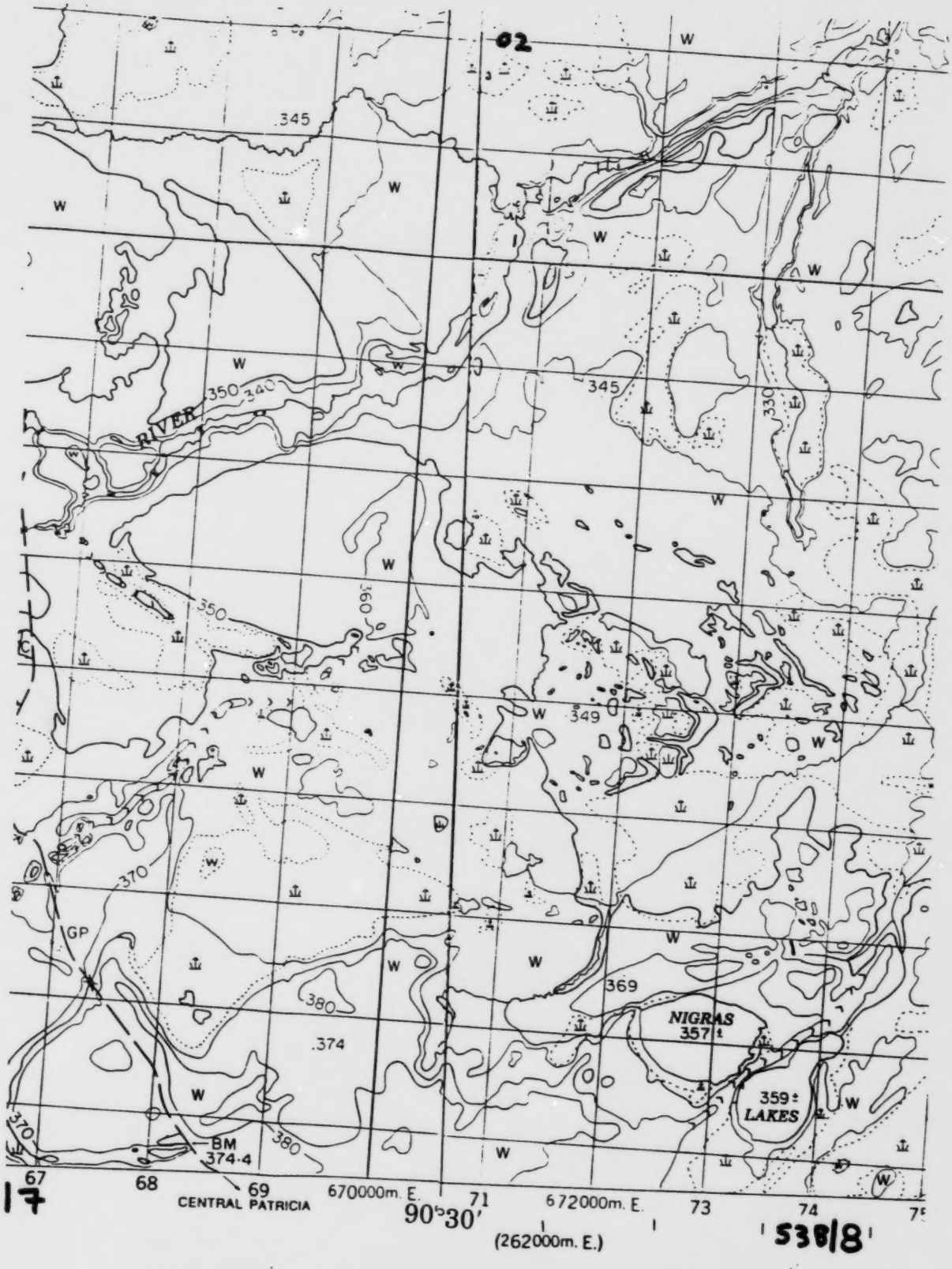
Known Dune Locations in West Patricia Planning Area

		NTS	UTM
1.	Shaver on Lac Seul Moraine	52N/4	610720
2.	Pembina River Dunes	52)	XG 45 65
3.	Spruce River Dunes	52P	BN 98 54
4.	Achapi Dunes	52P	CM 16 72
5.	Lysander Lake Dunes	52P	CN 08 59
6.	Otoskowin Dunes	52P	CN 25 43
7.	Bowern Lake Dunes	52P	CN 40 30
8.	Ozhiski Lake Dunes	52P	CN 80 50
9.	Wight Lake Dunes	53A	CP 09 13
10.	Sims Lake Dunes	53A	CP 44 36
11.	Pipestone River Dunes	53B	XH 72 95
12.	Sachigo Interlobate Moraine Dunes	53K	WL 50 30


West Patricia Land Use Plan
DUNES
Scale
Legend
known locations

A14208-23

Dune field along the Pipestone River.



17

ÉTABLIE PAR LA DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, OTTAWA, EN 1977. RENSEIGNEMENTS À JOUR EN 1970.

PRODUCED BY THE SURVEYS AND MAPPING BRANCH, DEPARTMENT OF ENERGY, MINES AND RESOURCES, OTTAWA, 1977. INFORMATION CURRENT AS OF 1970.

Topographic Map of Pipestone River, showing Dune Field.

3233
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